

DIRECTIONALLY SOLIDIFIED EUTECTIC SUPERALLOYS
FOR ELEVATED TEMPERATURE APPLICATIONS

ABSTRACT OF THE DISCLOSURE

The present invention provides directionally solidified eutectic superalloys for elevated temperature applications, such as turbine airfoil applications and the like. More specifically, the present invention provides directionally solidified eutectic nickel (Ni)-based superalloys comprising a matrix containing an aligned carbide reinforcing fibrous phase, such as an aligned tantalum carbide (TaC) reinforcing fibrous phase. The aligned carbide reinforcing fibrous phase provides preferential strengthening in one direction, resulting in enhanced elevated temperature strength, creep resistance, oxidation resistance, and corrosion resistance properties.